

Serial No. 09/_____ "CHEMICAL DERIVATIZATION OF SINGLE-WALL CARBON NANOTUBES TO FACILITATE SOLVATION THEREOF; AND USE OF DERIVATIZED NANOTUBES TO FORM CATALYST-CONTAINING SEED MATERIALS FOR USE IN MAKING CARBON FIBERS" to Margraves et al., (Attorney Docket No. 11321-P028US), filed concurrent to the date of this Application;

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IN THE CLAIMS:

Please delete claims 1-18 without prejudice or disclaimer.

Please add new claims 19-51 listed below.

1 19. (New) A method for derivatizing a sidewall of a single wall carbon nanotube
2 comprising reacting the single wall carbon nanotube with a fluorinating agent to bond fluorine to the
3 sidewall of the nanotube.

1 20. (New) The method of claim 19, wherein the fluorinating agent is selected from the
2 group consisting of fluorine, XeF₂, XeF₄, ClF₃, BrF₃, IF₅, AgF₂, and MnF₃.

1 21. (New) The method of claim 19, wherein the single wall carbon nanotube is reacted
2 with the fluorinating agent at a reaction temperature up to about 500°C.

1 22. (New) The method of claim 19, wherein the single wall carbon nanotube is reacted
2 with the fluorinating agent at a reaction temperature between about 250°C and about 400°C.

1 23. (New) The method of claim 19, wherein the amount of fluorine bonded to carbon
2 atoms of the single wall carbon nanotube is at a fluorine to carbon ratio of from (a) one fluorine atom
3 to about 26 carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 24. (New) The method of claim 23, wherein the amount of fluorine bonded to the carbon
2 atoms of the single wall carbon nanotube is at the fluorine to carbon ratio of from (a) one fluorine
3 atom to about ten carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 25. (New) The method of claim 24, wherein the amount of fluorine bonded to the carbon
2 atoms of the single wall carbon nanotube is at the fluorine to carbon ratio of from (a) one fluorine
3 atom to about three carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 26. (New) A method for derivatizing sidewalls of single wall carbon nanotubes
2 comprising:

3 (i) selecting a fluorinating agent from the group consisting of fluorine, XeF_2 ,
4 XeF_4 , ClF_3 , BrF_3 , IF_5 , AgF_2 , and MnF_3 ;

5 (ii) reacting the single wall carbon nanotubes with the fluorinating agent at a reaction
6 temperature up to about 500°C ; and

7 (iii) producing single wall carbon nanotubes having fluorine covalently bonded
8 to the sidewalls of the single wall carbon nanotubes.

1 27. (New) The method of claim 26 wherein the amount of fluorine bonded to carbon
2 atoms of the single wall carbon nanotubes is at a fluorine to carbon ratio of from (a) one fluorine
3 atom to about 26 carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 28. (New) The method of claim 27 wherein the amount of fluorine bonded to the carbon
2 atoms of the single wall carbon nanotubes is at the fluorine to carbon ratio of from (a) one fluorine
3 atom to about ten carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 29. (New) The method of claim 27 wherein the amount of fluorine bonded to the carbon
2 atoms of the single wall carbon nanotubes is at the fluorine to carbon ratio of from (a) one fluorine
3 atom to about three carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 30. (New) The method of claim 26 wherein the reaction temperature is between about
2 250°C and about 400°C .

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1 31. (New) A method for derivatizing sidewalls of single wall carbon nanotubes
2 comprising:

3 (i) reacting single wall carbon nanotubes with a fluorinating agent, wherein
4 the fluorinating agent is selected from the group consisting of fluorine, XeF₂, XeF₄, ClF₃,
5 BrF₃, IF₅, AgF₂, and MnF₃; and

6 (ii) producing single wall carbon nanotubes having fluorine covalently bonded
7 to the sidewall, wherein the single wall carbon nanotubes generally have a length from
8 about 5 nm to about 10,000 nm.

1 32. (New) The method of claim 31 wherein the single wall carbon nanotubes have a
2 length from about 5 nm to about 500 nm.

1 33. (New) A method to vary the conductivity of single wall carbon nanotubes comprising
2 the step of controlling the degree of fluorination of the carbon nanotube.

1 34. (New) A single wall carbon nanotube having fluorine covalently bonded to the
2 carbon atoms of a sidewall of the single wall carbon nanotube.

1 35. (New) The single wall carbon nanotube of claim 34, wherein the amount of fluorine
2 covalently bonded to carbon atoms of the single wall carbon nanotube is at a fluorine to carbon ratio
3 of from (a) one fluorine atom to about 26 carbon atoms to (b) one fluorine atom to about two carbon
4 atoms.

1 36. (New) The single wall carbon nanotube of claim 35, wherein the amount of fluorine
2 covalently bonded to the carbon atoms of the single wall carbon nanotube is at the fluorine to carbon
3 ratio of from (a) one fluorine atom to about ten carbon atoms to (b) one fluorine atom to about two
4 carbon atoms.

1 37. (New) The single wall carbon nanotube of claim 36, wherein the amount of fluorine
2 covalently bonded to the carbon atoms of the single wall carbon nanotube is at the fluorine to carbon
3 ratio of from (a) one fluorine atom to about three carbon atoms to (b) one fluorine atom to about two
4 carbon atoms.

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1 38. (New) The product made by the process of reacting single wall carbon nanotubes
2 with a fluorinating agent to covalently bond fluorine to the sidewalls of the single wall carbon
3 nanotubes.

1 39. (New) The product of claim 38, wherein the fluorinating agent is selected from the
2 group consisting of fluorine, XeF₂, XeF₄, ClF₃, BrF₃, IF₅, AgF₂, and MnF₃.

1 40. (New) The product of claim 38, wherein the single wall carbon nanotube is reacted
2 with the fluorinating agent at a reaction temperature up to about 500°C.

1 41. (New) The product of claim 38, wherein the single wall carbon nanotube is reacted
2 with the fluorinating agent at a reaction temperature between about 250°C and about 400°C.

1 42. (New) The product of claim 38, wherein the amount of fluorine covalently bonded
2 to carbon atoms of the single wall carbon nanotubes is at a fluorine to carbon ratio of from (a) one
3 fluorine atom to about 26 carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 43. (New) The product of claim 42, wherein the amount of fluorine covalently bonded
2 to the carbon atoms of the single wall carbon nanotubes is at the fluorine to carbon ratio of from (a)
3 one fluorine atom to about ten carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 44. (New) The product of claim 43, wherein the amount of fluorine covalently bonded
2 to the carbon atoms of the single wall carbon nanotubes is at the fluorine to carbon ratio of from (a)
3 one fluorine atom to about three carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 45. (New) A product made by the process comprising the steps of:

2 (i) selecting a fluorinating agent from the group consisting of fluorine, XeF₂,
3 XeF₄, ClF₃, BrF₃, IF₅, AgF₂, and MnF₃;

4 (ii) reacting single wall carbon nanotubes with the fluorinating agent at a reaction
5 temperature up to about 500°C; and

6 (iii) producing single wall carbon nanotubes having fluorine covalently bonded
7 to the sidewalls of the single wall carbon nanotubes.

1 46. (New) The product of claim 45, wherein the amount of fluorine bonded to carbon
2 atoms of the single wall carbon nanotubes is at a fluorine to carbon ratio of from (a) one fluorine
3 atom to about 26 carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 47. (New) The product of claim 46, wherein the amount of fluorine bonded to the carbon
2 atoms of the single wall carbon nanotubes is at the fluorine to carbon ratio of from (a) one fluorine
3 atom to about ten carbon atoms to (b) one fluorine atom to about two carbon atoms.

Q2 1 48. (New) The product of claim 47, wherein the amount of fluorine bonded to the carbon
2 atoms of the single wall carbon nanotubes is at the fluorine to carbon ratio of from (a) one fluorine
3 atom to about three carbon atoms to (b) one fluorine atom to about two carbon atoms.

1 49. (New) The product of claim 45, wherein the reaction temperature is between about
2 250°C and about 400°C.

1 50. (New) A product made by the process comprising:

2 (i) reacting single wall carbon nanotubes with a fluorinating agent, wherein the
3 fluorinating agent is selected from the group consisting of fluorine, XeF₂, XeF₄, ClF₃, BrF₃,
4 IF₅, AgF₂, and MnF₃; and

5 (ii) producing single wall carbon nanotubes having fluorine covalently bonded
6 to the sidewall, wherein the single wall carbon nanotubes generally have a length from about
7 5 nm to about 10,000 nm.

1 51. (New) The product of claim 40 wherein the single wall carbon nanotubes have a
2 length from about 5 nm to about 500 nm.

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Respectfully submitted,

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